AMENDMENTS TO THE SPECIFICATION:

Please amend the paragraph beginning at page 1, line 5, as follows:

The present invention relates to a method for the generation of three dimensional fractal subsurface structures by Voronoi Tessellation and computation of the gravity response of such fractal structures. The present invention has a wide range of applications in practically all geophysical exploration programs. The method provides ~~the~~ a sub-surface basin structure~~,~~ which is very close to the natural setting and hence can be very useful for ~~the~~ modeling of hydrocarbon ~~reservoir~~ reservoirs and mineral deposits for optimum estimation and simulation of the reserve having known precisely the extent and shape of the anomalous region by the ~~said~~ method, which uses a fractal approach. The fractal structure, being very irregular conforms to ~~the~~ natural geological situations, which have been utilized ~~herewith~~ to demonstrate its applicability in various geophysical exploration programs.

Please amend the paragraph beginning on page 1, lines 16 through 23, as follows:

The present exemplary embodiment of the invention ~~pertains to provide~~ provides a new approach for generation of three dimensional fractal subsurface ~~structure~~ structures by Voronoi tessellation and computation of the gravity response of such fractal structure~~, which comprises~~. This provides an efficient and ~~entirely~~ new way of fractal subsurface generation, which removes ~~all the~~ possibilities of getting into a reentrant structure while ~~perturbation of~~ perturbing Voronoi centers during iteration steps (involving in inverse modeling of the underlying structure and computation of the gravity response of such fractal subsurface, which constitutes forward modeling of the underlying structure for exploration of hydrocarbons and minerals).

Please amend the paragraph beginning on page 1, lines 23 through 31, as follows:

It is known from ~~the~~ gravitational law that ~~the~~ bodies having mass ~~would~~ exert attractional force on each other. In geophysical ~~aspect~~ aspects instead of mass, the density plays a direct role in gravity surveys since density varies laterally as well as vertically, and hence affects the mass of a volume. It could be posed in a way that if a large object is having density contrast with its ~~surrounding~~ surroundings then it will reflect its signature in the observed gravity field. In case of geophysical studies the density contrast between different interfaces is responsible for the gravity anomaly, which in turn can be studied either for hydrocarbon exploration or for geological studies ~~also~~.

Please amend the paragraph beginning on page 3, line 33 through page 4, line 4, as follows:

There is a need for a method for efficient and accurate delineation of subsurface structure which is close to the real geology present below the earth surface in two ~~dimension~~ dimensions and three ~~dimension~~dimensions. Such a method should preferably be able to use physical property variations in the subsurface geometry. Also, the method should preferably be able to obtain a realistic forward model of anomalous formations that are expected in a normal sedimentary basin, which can be used in exploration. The present invention satisfies this need.

Please amend paragraph beginning on page 4, lines 6 through 8, as follows:

~~The~~ A main ~~object~~ aspect of the invention is to provide a method for the generation of three dimensional fractal subsurface structures by Voronoi Tessellation and computation of a gravity response of such fractal structure, which obviates ~~the~~ drawbacks as detailed above.

Please amend paragraph beginning on page 4, lines 9 through line 14, as follows:

Another ~~object~~ aspect of the present invention is to provide an efficient method for generation of a fractal subsurface which is very close to real geological situations.

Please amend paragraph beginning on page 4, lines 15 through 18, as follows:

Yet another ~~object~~ aspect of the present invention ~~is to show that the present invention~~ has ~~its~~ direct implication in reservoir modeling by ~~way of~~ generating complex geological situations wherein the variation of physical properties can be very well studied and predicted using a fractal approach.

Please amend paragraph beginning on page 4, lines 19 through 20, as follows:

Yet another ~~object~~ aspect of the present invention is to provide ~~an excellent idea~~ applications which can be used in any branch of geophysical exploration.

Please amend paragraph beginning on page 4, lines 22 through 27, as follows:

~~Accordingly the present invention provides a~~ A method is provided for the generation of three dimensional fractal subsurface ~~structure~~ structures by Voronoi tessellation and computation of a gravity response of such fractal structure~~, which comprises~~. This provides a robust and efficient process for generation of fractal subsurface structures, which is very close to a natural setting of the subsurface geology and which provides computation of forward gravity ~~response~~ responses of such structures for delineation of ~~the~~ an underlying anomalous object.

Please amend paragraph beginning on page 5, lines 5 through 8, as follows:

Fig. 1(a) and (b) ~~represents~~ represent the fundamental of existing Voronoi tessellation ~~where in~~ wherein circles 10 are drawn ~~(shown in blue color)~~ with increasing radius about the Voronoi centers 12 ~~(shown in red color)~~ and a tangent line 14 ~~(shown in green color)~~ is drawn where the adjacent circles touches each other. Fig. 1(b) shows the particular case of generating a layered model.

Please amend paragraph beginning on page 5, lines 9 through 12, as follows:

Fig. 2(a) ~~represent~~ represents a general case where a polygonal structure is generated using 15 Voronoi centers 16 ~~(shown as red dots)~~ using existing Voronoi tessellation. Fig. 2(b) represents a subsurface generated by modified Voronoi tessellation (defined by dotted lines) using four Voronoi centers (shown as bolded black stars~~dots~~).

Please amend paragraph beginning on page 5, lines 13 through 17, as follows:

Fig. 3 represents ~~the~~ a 3-D subsurface structure wherein 2-D layers of variable physical property regions are overlain to generate 3-D volume. 2-D layers are shown separate for the sake of clarity of ~~pyhsical~~physical property variations shown in each layer. The figure ~~demonstrate~~ demonstrates the ability ~~of~~ for generating various kind of structures shown in different layers merely by changing exponent p in L^p norm, keeping Voronoi centers fixed.

Please amend paragraph beginning on page 5, lines 18 through 22, as follows:

Fig. ~~4.~~ represents ~~the~~ a 3-D structure wherein layers of different physical property variations are shown. The figure ~~demonstrate the~~ demonstrates another possibility ~~of~~ for

various structures as shown in different layers by changing Voronoi centers keeping exponent p constant in L^p norm.

Please amend paragraph beginning on page 5, line 23, as follows:

Fig. 5 represents a grid overlain on ~~the~~ a region of interest.

Please amend paragraph beginning on page 5, lines 24 through 28, as follows:

Fig. 6(a) represents an example of a gravity anomaly response over the simplified horizontal layered model. Fig. 6(b) represents~~Represents~~ an example of gravity response calculated over a fractal subsurface structure showing four regions of different physical property (density) variations. Density values assigned to ~~red, blue, green and magenta colors~~ differently shaded areas are 2.1, 2.3, 2.67 and 2.5 g/cc respectively, and the depth at which fractal subsurface is assumed is 10 units.

Please amend paragraph beginning on page 5, lines 29 through 30, as follows:

Fig. 7 represents a flow chart of the procedure adopted for the computation of a gravity response over a fractal subsurface.

Please amend paragraph beginning on page 5, line 31, as follows:

Detailed description of ememplary embodiments of invention

Please amend paragraph beginning on page 5, lines 32 through page 6, line 1, as follows:

The present ~~invention~~ exemplary embodiment brings a new facet of domain characterization ~~by~~ using a set of parameters, referred herein as Voronoi centers. These parameters are perturbed and thus the different tessellated regions are generated at different depths. This characterization is very suitable and entails the development for solution of geophysical inverse problems with the help of non-local optimization techniques.